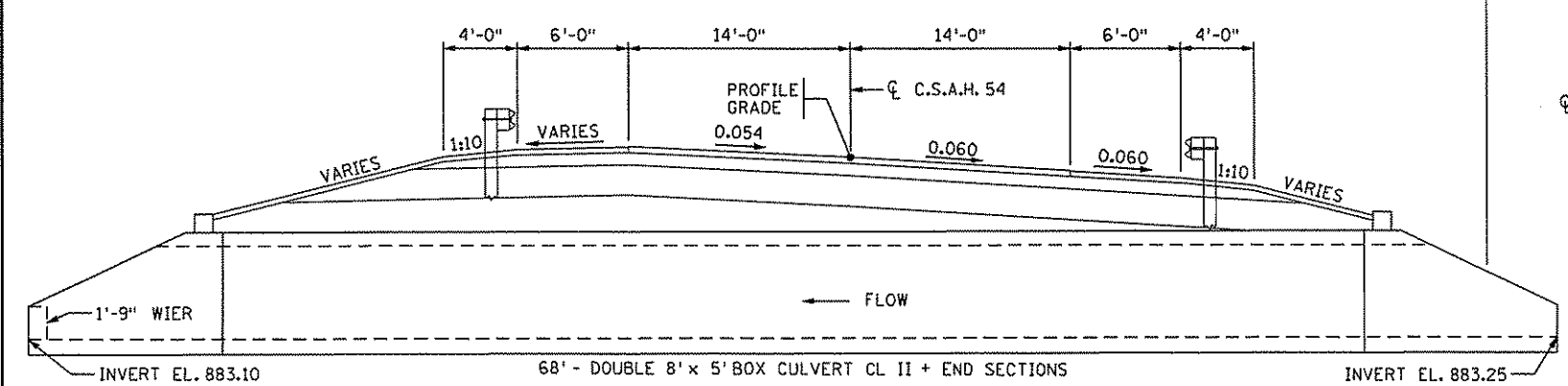
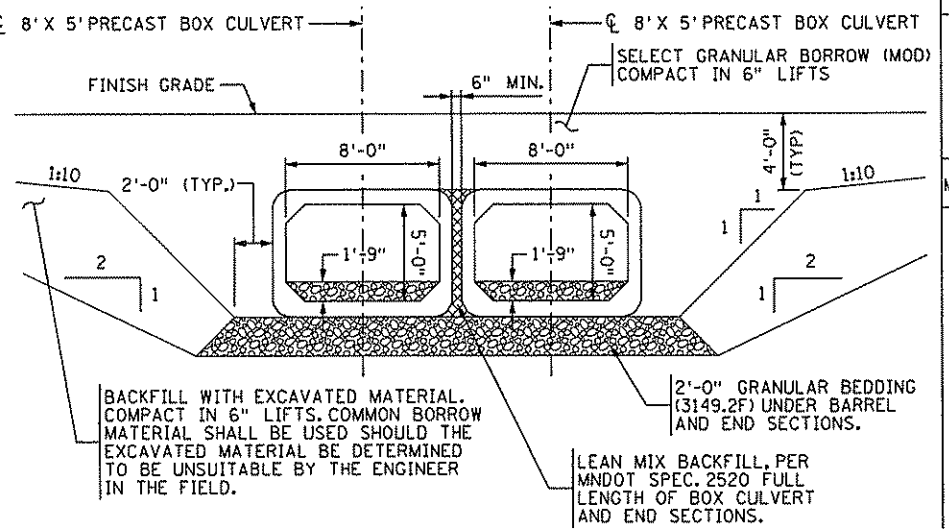


GENERAL PLAN - DOUBLE 8'-0" X 5'-0" PRECAST BOX CULVERT



GENERAL ELEVATION - DOUBLE 8'-0" X 5'-0" PRECAST BOX CULVERT



SECTION A-A THRU PRECAST BOX CULVERT

SCHEDULE OF QUANTITIES FOR BRIDGE

ITEM NO.	2451.601	2451.507	2511.501	2412.511	2412.512	2442.501	2511.515	2520.501	2511.501
ITEM	STRUCTURE EXCAVATION CLASS U	GRANULAR BEDDING (LV)	RANDOM RIPRAP, CLASS III	8' X 5' PRECAST CONCRETE BOX CULVERT	8' X 5' PRECAST CONCRETE BOX CULVERT END SECTION	REMOVE OLD BRIDGE 90734	GEOTEXTILE FILTER TYPE IV	LEAN MIX BACKFILL	RANDOM RIPRAP, CLASS II
UNIT	LUMP SUM	CU. YD.	CU. YD.	LIN. FT.	EACH	LUMP SUM	SQ. YD.	CU. YD.	CU. YD.
QUANTITY	1	202	97 (P)	136 (P)	4 (P)	1 (P)	215	10 (P)	92 (P)

NO.	DATE	BY	CHK	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/16/10 REG NO: 45801

**C.S.A.H. 54
 ANOKA COUNTY
 S.A.P. 02-654-02**

TITLE: **GENERAL PLAN AND ELEVATION**

DESIGN DATA

2007 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
 DESIGN LOADING HS25 LIVE LOAD

INSIDE HEIGHT 5'-0"
 INSIDE WIDTH 8'-0"
 BARREL EXTENSION LENGTH 68'-0" (EACH)
 DESIGN FILL DEPTH 2'-0" - 8'-0"

MAXIMUM ALLOWABLE DESIGN STRESSES:

REINFORCED CONCRETE:
 f'_c = 5,000 P.S.I. n = 8
 f'_y = 65,000 P.S.I. REINFORCEMENT

STRUCTURAL STEEL:
 f_y = 36,000 P.S.I.
 STRUCTURAL STEEL MNDOT 3306

LIST OF SHEETS

NO.	DESCRIPTION
B1	GENERAL PLAN AND ELEVATION
B2	PRECAST BOX CULVERT BARREL DETAILS
B3	PRECAST CONCRETE END SECTION TYPE III
B4	PRECAST CONCRETE END SECTION TYPE III
B5	ALTERNATE DROPWALLS FOR BOX CULVERT
B6	EMBANKMENT PROTECTION FOR BOX CULVERTS
B7	BRIDGE SURVEY
B8	BRIDGE SURVEY - PLAN & PROFILE

APPROVED: *[Signature]*
 ANOKA COUNTY ENGINEER

DATE: 4/24/11

701 Xenia Avenue
 Suite 300
 Minneapolis, MN 55416

WSB
 & Associates, Inc.
 INFRASTRUCTURE - ENGINEERS - PLANNERS

783-541-4800
 FAX 783-541-1700

MINNESOTA DEPARTMENT OF TRANSPORTATION

**DOUBLE 8' X 5' CULVERT
 GENERAL PLAN & ELEVATION**

Bridge No. 02J43

BRIDGE LOCATED ON C.S.A.H.54
 1/4 MILE NORTH OF JCT. C.S.A.H. 54
 AND C.R 140 OVER HARDWOOD CREEK.

SEC. 2 TWP. 31 N R. 22 W
 CENTERVILLE TOWNSHIP ANOKA COUNTY

DES: JDA DR: BJR
 CHK: BRL CHK: JDA

02J43

Sheet B1 of B8 Sheets

5/9/2011 12:22:11 PM
 K:\01898-00\Cad\Plan\BR02.J43\CBR02.J43_dpe.dgn

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER Mn/DOT SPEC. 2412 EXCEPT AS NOTED.

FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. SEE FIG. 5-395.100(A) AND FIG. 5-395.100(B) FOR ADDITIONAL INFORMATION.

IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (Mn/DOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. MINIMUM DISTANCE REQUIRED IS 6".

THE STEEL FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1 1/2" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
 (a) 1 OR 2 LAYERS OF MESH OR
 (b) 1 LAYER OF MESH AND 1 LAYER OF REINFORCEMENT BARS OR
 (c) 1 LAYER OF REINFORCEMENT BARS.

THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WIRE MESH, THE AREAS OF REINFORCEMENT SHALL BE INCREASED BY 8%.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 19. THE MAXIMUM MESH SIZE SHALL BE 1/2" DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

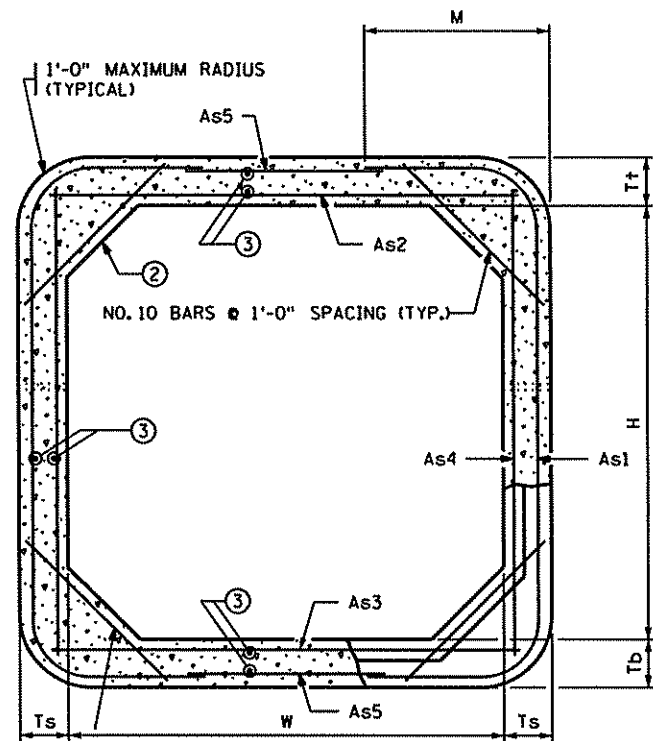
WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

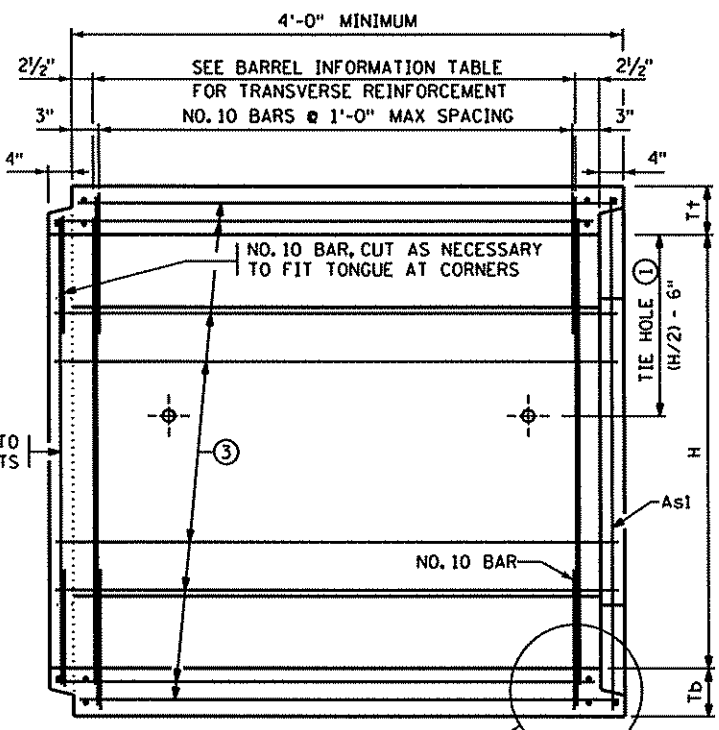
CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER Mn/DOT SPEC. 3238.2A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

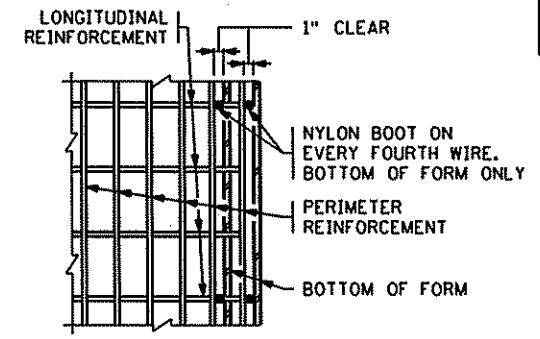
- ① CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.
- ② HAUNCH SIZE AS FOLLOWS:
 6'-0" AND 8'-0" WIDTHS - 6" TO 12"
 10'-0" WIDTH - 10" TO 12"
 12'-0" AND 14'-0" WIDTHS - 12"
- ③ MINIMUM LONGITUDINAL STEEL SHALL BE 0.06 SQ. IN./FT.



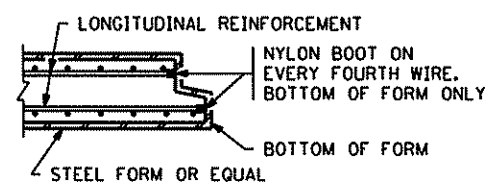
TRANSVERSE BARREL SECTION
BAR REINFORCEMENT OPTION SHOWN



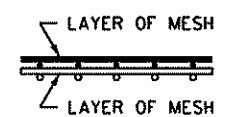
LONGITUDINAL BARREL SECTION
BAR REINFORCEMENT OPTION SHOWN



PLAN

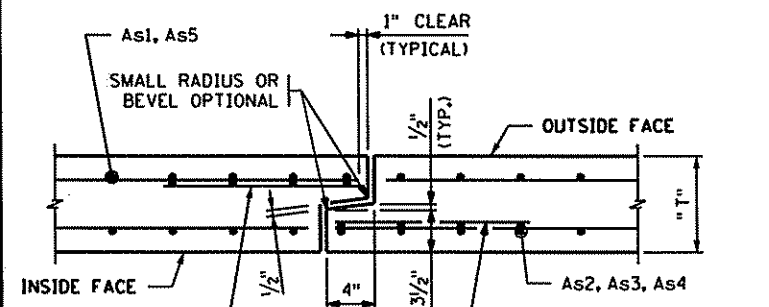


SECTION FORMING DETAIL



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN



TONGUE AND GROOVE JOINT DETAIL

BARREL INFORMATION																					
LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DIMENSIONS					WEIGHT (LBS./FT.)	STEEL FABRIC REINFORCEMENT										
					W (FT.)	H (FT.)	T+ (IN.)	Tb (IN.)	Ts (IN.)		As1		As2		As3		As4		As5		
											AREA (IN. ² /FT.)	LENGTH (FT.)	M (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)
16+08.50	8' X 5'	2	5000	2' - 10'	8	5	9	10	8	3435	0.41	10'-3"	2'-6"	0.60	8'-6"	0.53	8'-6"	0.20	5'-6"	0.06	6'-3"
16+19.12	8' X 5'	2	5000	2' - 10'	8	5	9	10	8	3435	0.41	10'-3"	2'-6"	0.60	8'-6"	0.53	8'-6"	0.20	5'-6"	0.06	6'-3"

REVISION:
 APPROVED: DECEMBER 11, 2000
 [Signature]
 STATE BRIDGE ENGINEER

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/16/00 REG NO: 45501

WSB
 & Associates, Inc.
 701 Xenia Ave. South
 Suite 300
 Minneapolis, MN 55416
 763-541-4800
 FAX 763-541-1700
 INFRASTRUCTURE - ENGINEERS - PLANNERS

C.S.A.H. 54
ANOKA COUNTY
S.A.P. 02-654-02

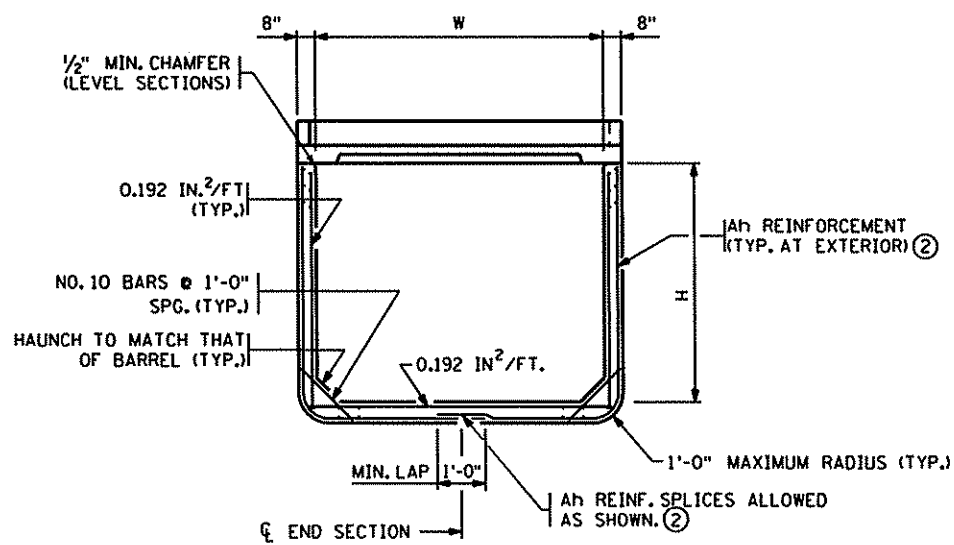
TITLE:
BARREL DETAILS

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B2 of B8 Sheets

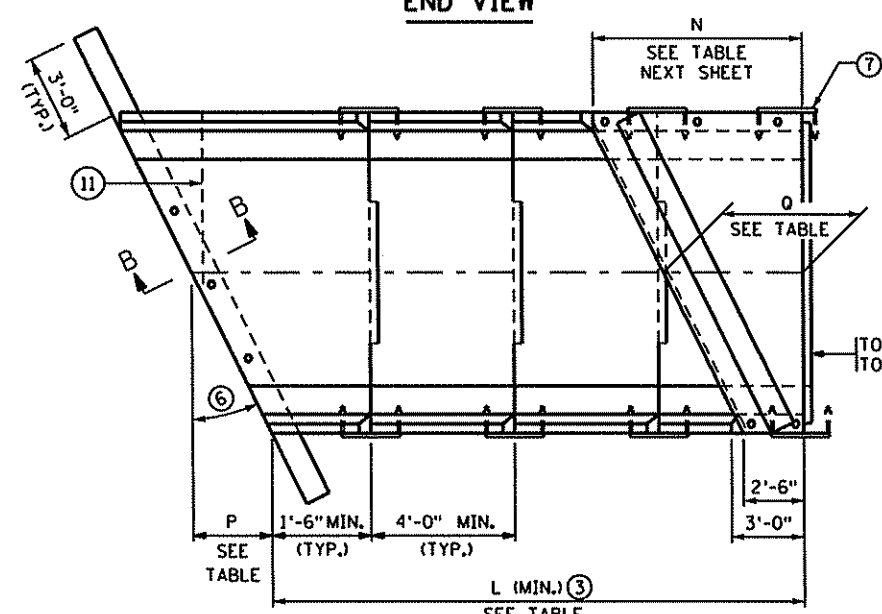
Bridge No.
02J43

FIG. 5-395.101(A)

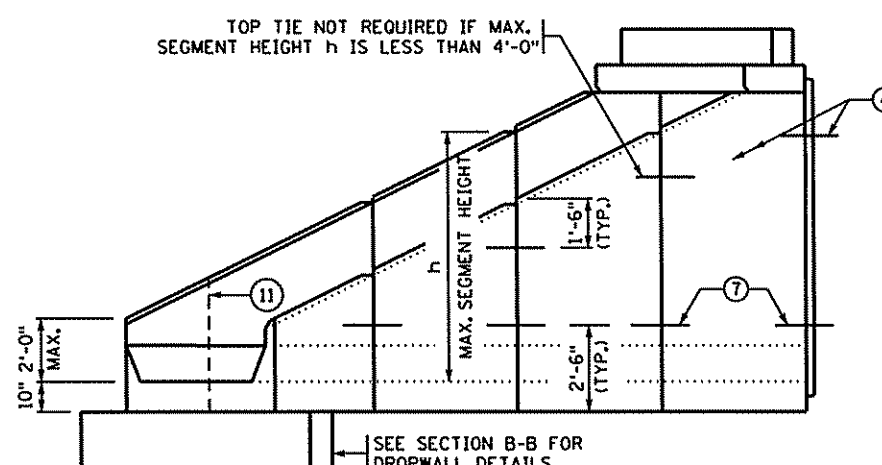
12/16/2000 3:43:43 PM K:\0898-00\cad\plan\BR02J43\CBR02J43_DET1.dgn



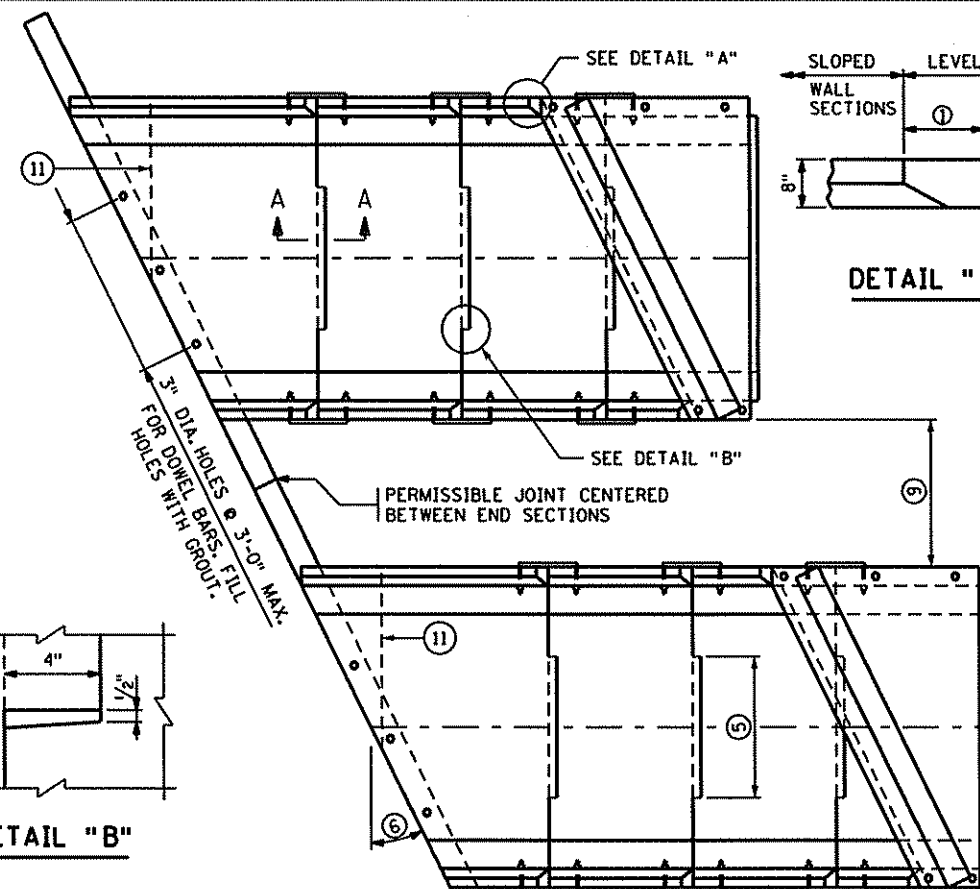
END VIEW



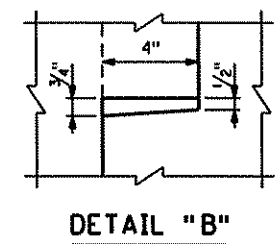
PLAN VIEW
SINGLE BARREL OPTION



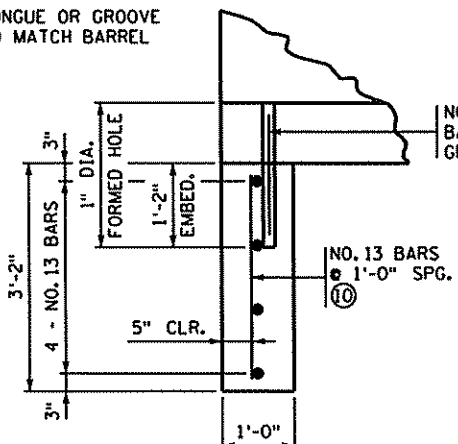
ELEVATION



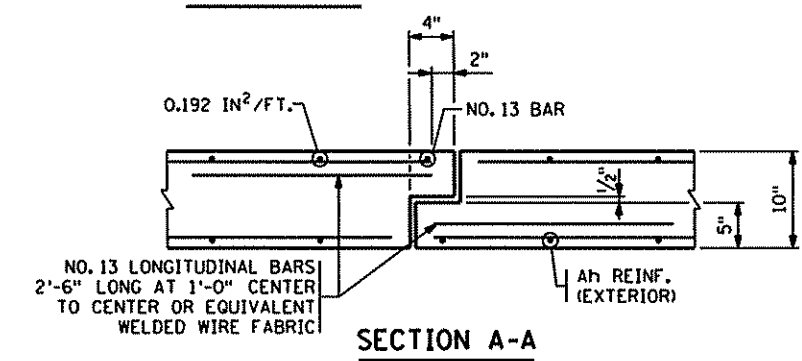
PLAN VIEW
DOUBLE-BARREL OPTION



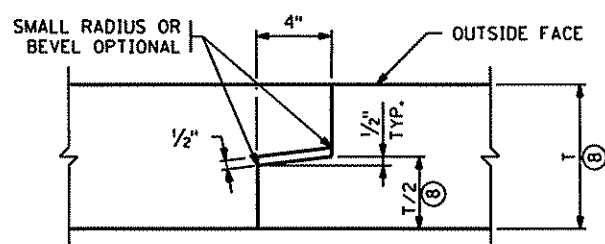
DETAIL "B"



SECTION B-B

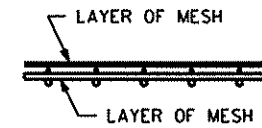


SECTION A-A



TONGUE AND GROOVE JOINT

MAKE DIMENSION OF TONGUE OR GROOVE ON ADJACENT PRECAST BARREL SECTIONS SO INSIDE WALLS ARE FLUSH.



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN

CONSTRUCTION NOTES

- SEE FIG. 5-395.101(A) AND FIG. 5-393.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.
- ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.
- FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.
- PRECAST CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.
- DROPWALL CONCRETE SHALL BE MIX NO. 1A43 OR 3Y43. LIMITS FOR DROPWALL EXCAVATION TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS.
- LONGITUDINAL REINFORCEMENT SHALL BE A MINIMUM OF 0.06 SQ. IN. PER FT. ON BOTH FACES.
- NO TONGUE OR GROOVE REQUIRED IN WALLS BETWEEN END SECTIONS.
- SEE FIG. 5-395.115 FOR EMBANKMENT PROTECTION.
- GROUT SHALL CONSIST OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX SHALL HAVE A MAXIMUM SLUMP OF 4".
- ① 8/8" @ 15"; 10/8" @ 30"; 1'-2" @ 45"
- ② SEE FIG. 5-395.110(B) FOR REINFORCEMENT TABLES.
- ③ NUMBER OF SECTIONS VARIES WITH "H" DIMENSION.
- ④ EXCEPT AS NOTED, CULVERT TIES ARE TO BE 1" DIA RODS. SEE STANDARD PLATE NO. 3145 FOR DETAILS.
- ⑤ 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE AND GROOVE ON C OF EACH APRON JOINT.
- ⑥ FOR SKEW ANGLES OVER 7 1/2° UP TO 22 1/2°, USE A 15° SKEW END SECTION. FOR SKEW ANGLES OVER 22 1/2° UP TO 37 1/2°, USE A 30° SKEW END SECTION. FOR SKEW ANGLES OVER 37 1/2° UP TO 45°, USE A 45° SKEW END SECTION.
- ⑦ PROVIDE EXTRA STRONG CONNECTION AT LOCATION SHOWN; REQUIRED ONLY ON HIGH FILL SIDE FOR 45° SKEW END SECTIONS OVER 6'-0" HIGH. SEE FIG. 5-395.110(B) FOR DETAILS.
- ⑧ DIMENSION "T" IS EQUAL TO Tt, Td OR Ts.
- ⑨ IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (Mn/DOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. (ALSO, PROVIDE APPROVED GROUT SEEPAGE CORE, MINIMUM 12" THICK, BETWEEN THE CULVERT'S TWO ENDS.) MINIMUM DISTANCE REQUIRED BETWEEN DOUBLE BARRELS IS 6".
- ⑩ AS AN ALTERNATE TO THE ONE LAYER MESH CONTRACTOR MAY PROVIDE TWO LAYERS OF REBAR OR WIRE MESH WITH THE STEEL AREA EQUAL TO HALF OF THE TEMPERATURE STEEL PER CODE REQUIREMENTS IN EACH FACE OF THE DROPWALL.
- ⑪ ON THE LAST SEGMENT OF THE 45° SKEWED APRONS, A TRANSVERSE JOINT IN THE BOTTOM IS PERMITTED. A SPECIAL TIE, SIMILAR TO THE SIDE TIE, MUST BE PROVIDED. THE TIE SHALL BE INSET AND THE SPACE FILLED WITH AN APPROVED GROUT.

LENGTH P			
WIDTH W (FT.)	15° SKEW	30° SKEW	45° SKEW
6	0'-11 3/4"	2'-1 3/8"	3'-8"
8	1'-3"	2'-8 3/8"	4'-8"
10	1'-6 1/4"	3'-3 1/4"	5'-8"
12	1'-9 3/8"	3'-10 1/4"	6'-8"
14	2'-0 3/8"	4'-5 1/8"	7'-8"

MIN. LENGTH L			
HEIGHT H (FT.)	15° SKEW	30° SKEW	45° SKEW
4	7'-1 3/4"	7'-7 3/8"	8'-7 1/8"
5	9'-2 1/2"	9'-11 1/8"	11'-5 3/8"
6	11'-3 3/8"	12'-2 3/8"	14'-3 3/4"
7	13'-4 1/4"	14'-6 5/8"	17'-1 3/4"
8	15'-5 1/8"	16'-10 1/4"	19'-11 1/8"
9	17'-5 5/8"	19'-2"	22'-9 3/8"
10	19'-6 3/4"	21'-5 3/4"	25'-7 1/2"
11	21'-7 5/8"	23'-9 3/8"	28'-5 1/2"
12	23'-8 1/2"	26'-1 1/8"	31'-3 3/8"
13	25'-9 3/8"	28'-4 3/8"	34'-1 3/8"
14	27'-10 1/8"	30'-8 1/2"	36'-11 1/4"

LENGTH Q			
WIDTH W (FT.)	15° SKEW	30° SKEW	45° SKEW
6	3'-5 3/4"	4'-7 3/8"	6'-2"
8	3'-9"	5'-2 3/8"	7'-2"
10	4'-0"	5'-9 1/4"	8'-2"
12	4'-3 3/8"	6'-4 1/8"	9'-2"
14	4'-6 3/8"	6'-11 1/8"	10'-2"

FIG. 5-395.110(A)

REVISED: 09-17-2004
 APPROVED: DECEMBER 11, 2000
 State Bridge Engineer

NO	DATE	BY	CHK	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
 DATE: 12/11/19 REG NO: 45501

701 Xenia Ave. South
 Suite 300
 Minneapolis, MN 55416
 763-541-4800
 FAX 763-541-1700
W&B
 & Associates, Inc.
 INFRASTRUCTURE - ENGINEERS - PLANNERS

C.S.A.H. 54
ANOKA COUNTY
S.A.P. 02-654-02

TITLE: **PRECAST CONCRETE END SECTION TYPE III**

DES: JDA DR: BJR
 CHK: BRL CHK: JDA
 Sheet B3 of B8 Sheets

Bridge No. **02J43**

12/16/2010 10:05:02 AM K:\01898-00\cadd\plan\BRO2\43\CBR02\43_DET12.dgn

Ah REINFORCEMENT		
HEIGHT h (FT.)	Ah (IN ² /FT.)	
	15° & 30° SKEW	45° SKEW
7 OR LESS	0.192	0.192
8	0.20	0.24
9	0.29	0.36
10	0.42	0.53
11	0.60	0.75
12	0.78	0.98
13	1.03	1.36
14	1.38	1.85

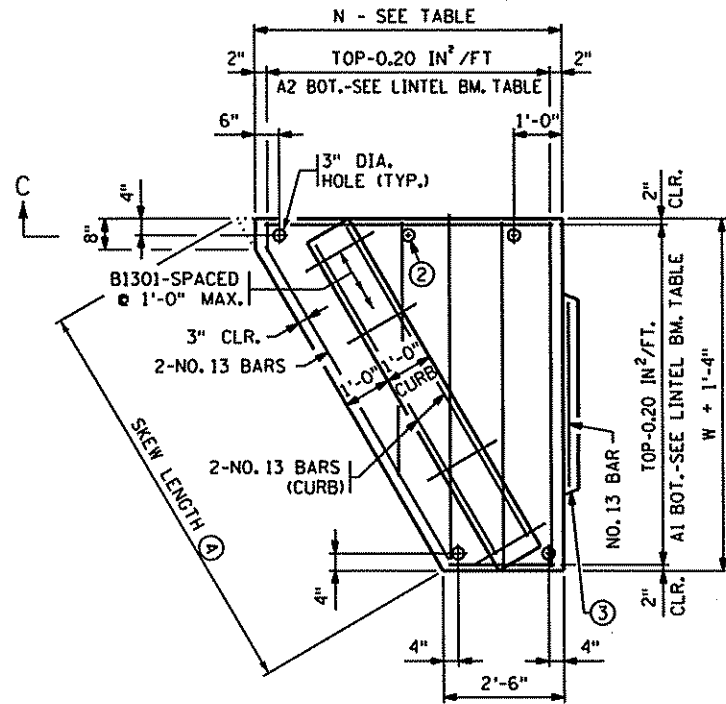
NOTE: h IS THE LARGEST VERTICAL DIMENSION OF THE SEGMENT.

LINTEL BEAM REINFORCEMENT		
WIDTH W (FT.)	BOTTOM REINFORCEMENT	
	A1	A2
6	NO. 13 @ 1'-6"	NO. 13 @ 1'-4"
8	NO. 13 @ 1'-1"	NO. 13 @ 9"
10	NO. 13 @ 9"	NO. 13 @ 6"
12	NO. 16 @ 9"	NO. 16 @ 6"
14	NO. 19 @ 9"	NO. 22 @ 6"

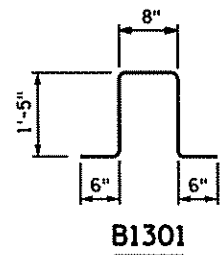
LENGTH N			
WIDTH W (FT.)	SKEW		
	15°	30°	45°
6	4'-3 ³ / ₈ "	6'-4 ¹ / ₄ "	9'-2"
8	4'-9 ³ / ₈ "	7'-6"	11'-2"
10	5'-4 ¹ / ₄ "	8'-7 ³ / ₈ "	13'-2"
12	5'-10 ³ / ₄ "	9'-9 ³ / ₄ "	15'-2"
14	6'-5 ¹ / ₈ "	10'-11 ³ / ₈ "	17'-2"

CONSTRUCTION NOTES

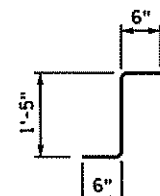
- ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.
- GROUT SHALL CONSIST OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX SHALL HAVE A MAXIMUM SLUMP OF 4".
- STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.
- WELDING PER Mn/DOT SPEC. 2471.
- GALVANIZE STRUCTURAL STEEL PER Mn/DOT SPEC. 3394.
- GALVANIZE BOLTS, NUTS AND WASHERS PER Mn/DOT SPEC. 3392.
- NO. 25 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE WALL SECTION AND 3" DIA. HOLE IN THE LINTEL. FILL HOLE WITH GROUT.
 - PROVIDE ADDITIONAL 3" HOLES AT 4'-0" MAXIMUM SPACING WHEN SIDE OF LINTEL BEAM IS OVER 6 FT.
 - CHECK THE LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED. TONGUE AND GROOVE TO TERMINATE AT CULVERT RADIUS.
 - FOR SKEW LENGTH UNDER 10' USE NO. 25 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 29 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 32 BARS. FOR SKEW LENGTH OVER 18' TO 22' USE NO. 36 BARS OR EQUAL. SKEW LENGTH IS DISTANCE BETWEEN OUTSIDE FACES OF END SECTION ALONG LINTEL BEAM.
 - FOR CULVERTS LESS THAN 14' WIDE, USE 9" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE. FOR 14' WIDE CULVERTS, WITH A 15° SKEW, USE 9" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE. FOR 14' WIDE CULVERTS, WITH A 30° OR 45° SKEW, USE 10" LINTEL BEAM THICKNESS WITH 5000 P.S.I. CONCRETE (OR USE 9" LINTEL BEAM THICKNESS WITH 6500 P.S.I. CONCRETE).
 - ALTERNATE BAR BEND MAY BE USED FOR B1301.



PLAN VIEW
LINTEL BEAM WITH INTEGRAL CURB

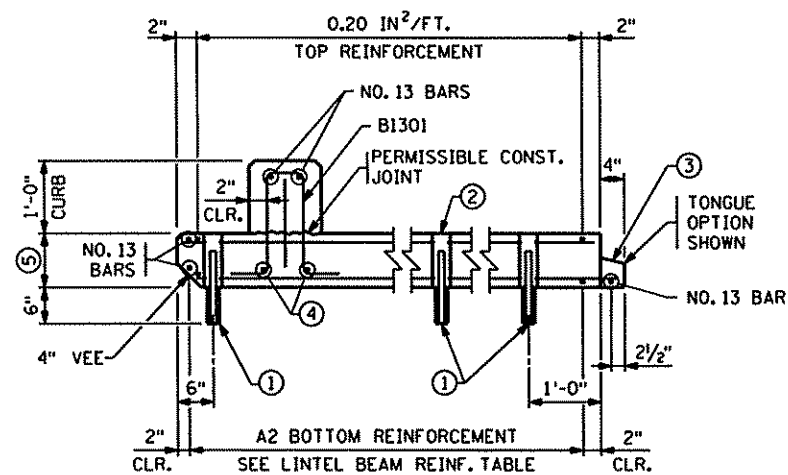


B1301

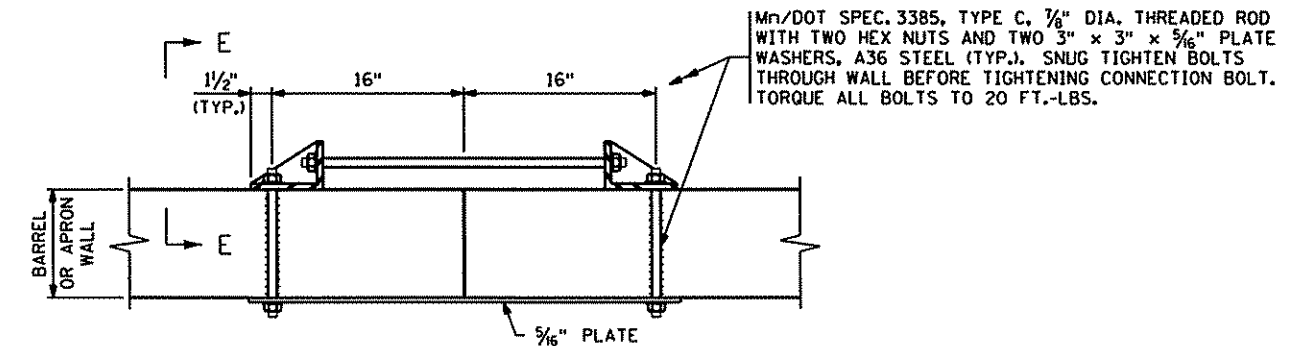


B1301
ALTERNATE

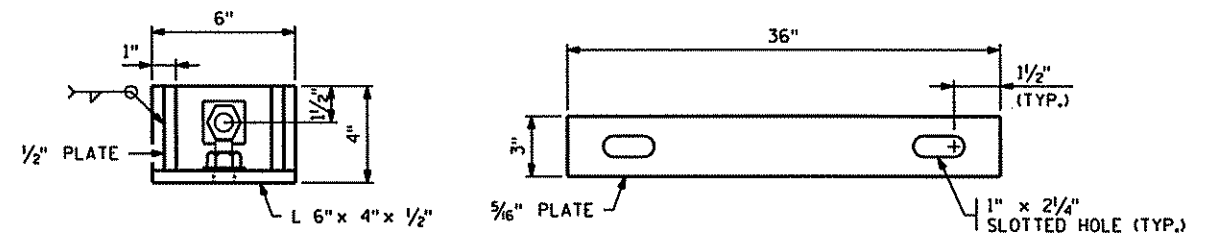
⑥
2 REQUIRED



SECTION C-C



PLAN VIEW



SECTION E-E

PLATE DETAIL

EXTRA STRONG CONNECTION DETAILS

REVISED: 09-17-2004

APPROVED: DECEMBER 11, 2000

Donald J. Fleming
STATE BRIDGE ENGINEER

NO	DATE	BY	CHK	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

James Archer
LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
DATE: 12/11/00 REG NO.: 45501

WSB
& Associates, Inc.
INFRASTRUCTURE - ENGINEERS - PLANNERS

701 Xenia Ave. South
Suite 300
Minneapolis, MN 55416
763-541-4800
FAX 763-541-1700

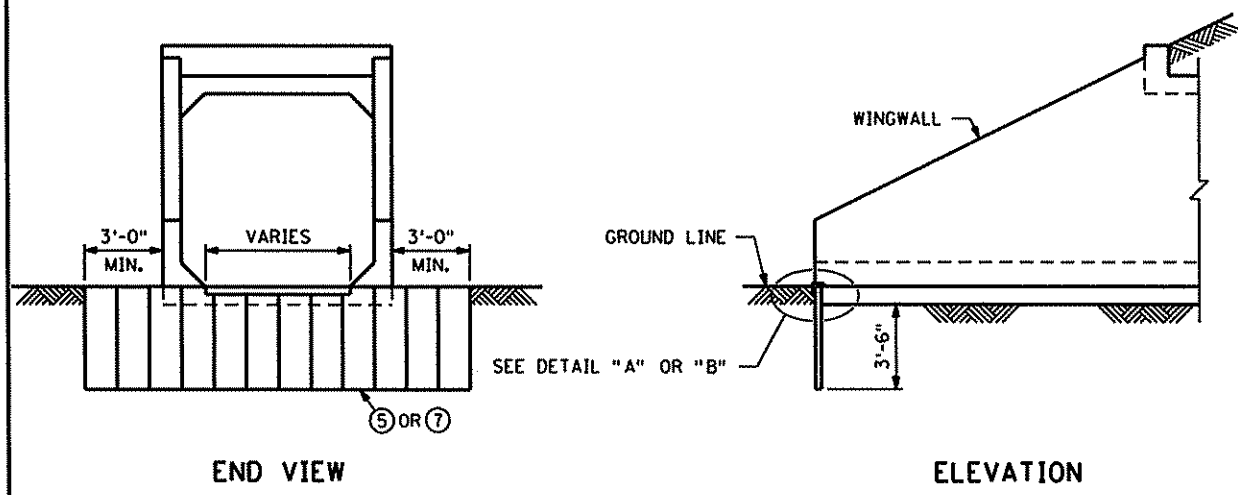
C.S.A.H. 54
ANOKA COUNTY
S.A.P. 02-654-02

TITLE:
PRECAST CONCRETE
END SECTION TYPE III

DES: JDA DR: BJR
CHK: BRL CHK: JDA
Sheet B4 of B8 Sheets

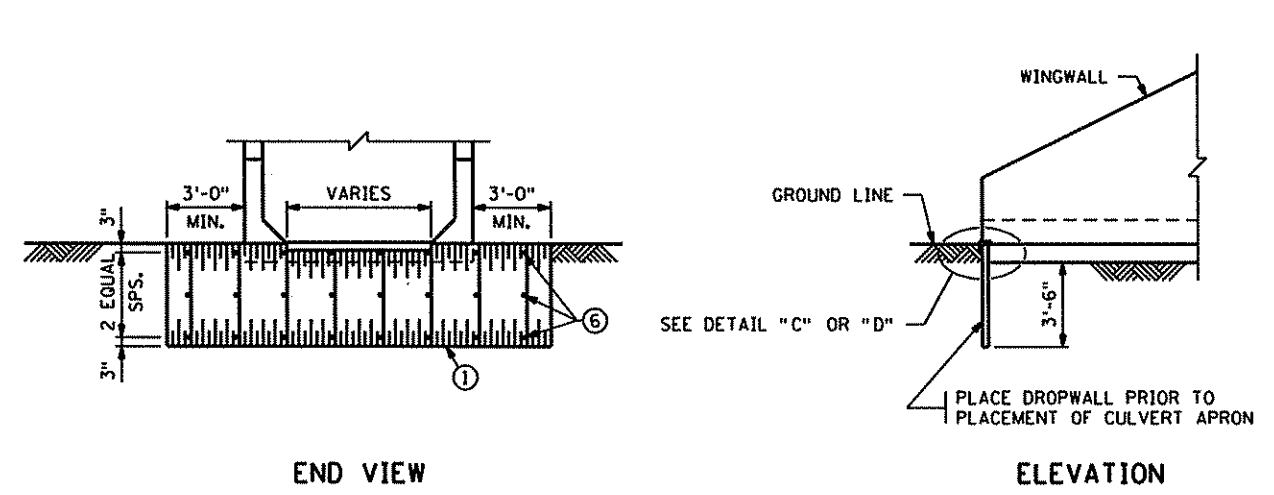
FIG. 5-395.110(B)

Bridge No.
02J43



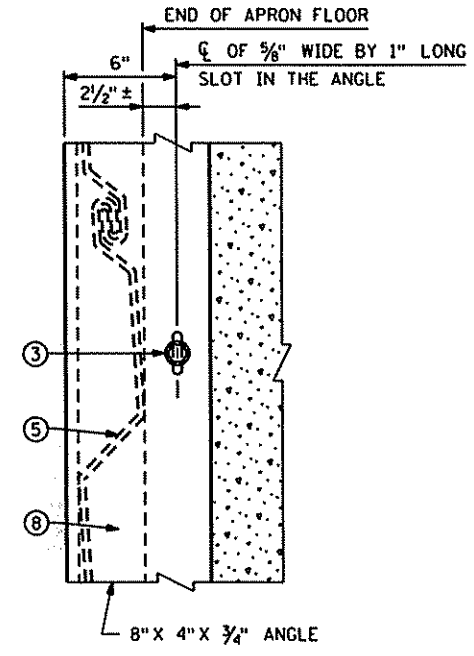
END VIEW ELEVATION

ALTERNATES 1 & 2 (STEEL SHEET PILING)

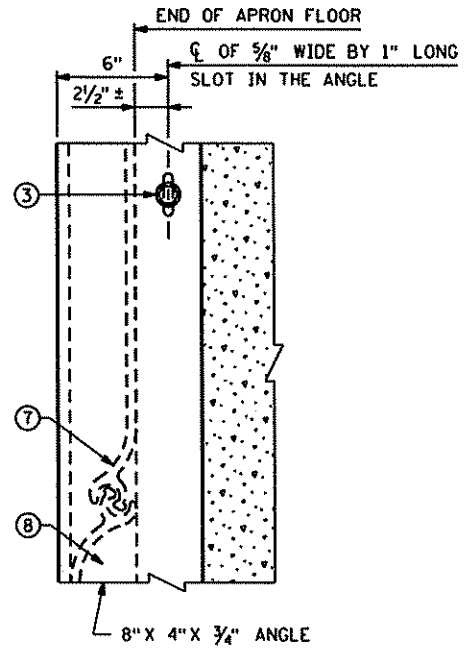


END VIEW ELEVATION

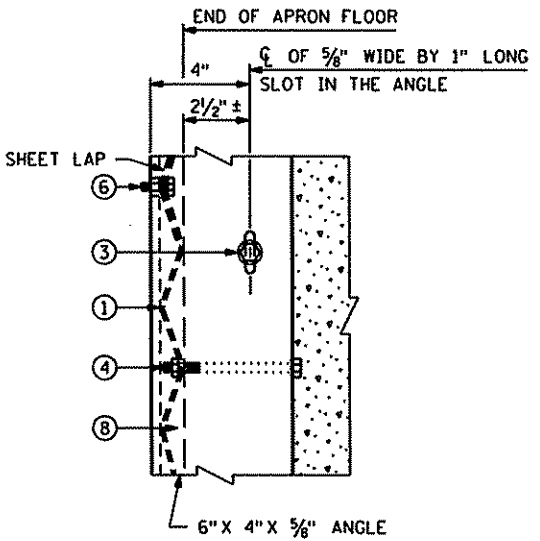
ALTERNATES 3 & 4 (GALVANIZED STEEL SHEETS)



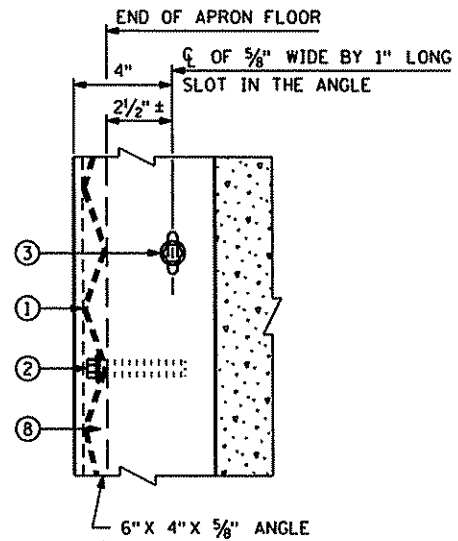
PLAN



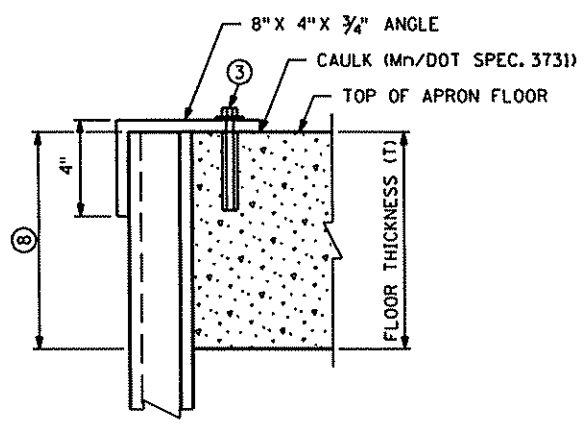
PLAN



PLAN

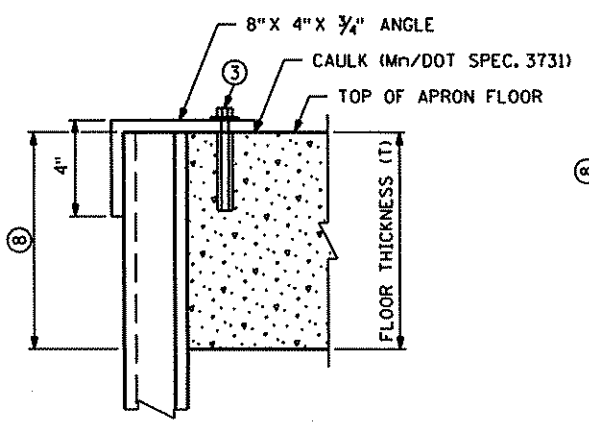


PLAN



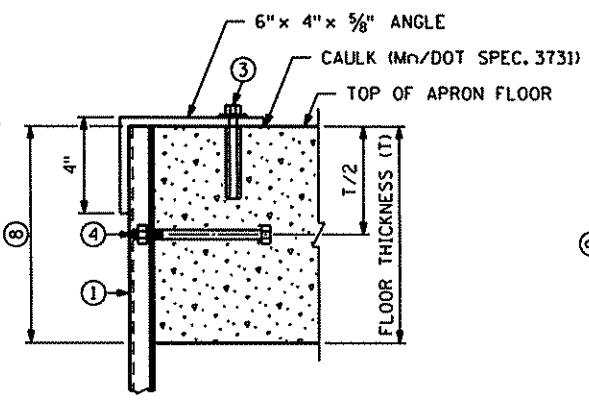
ELEVATION

DETAIL "A" - ALTERNATE 1
STEEL SHEET PILING SHOWN



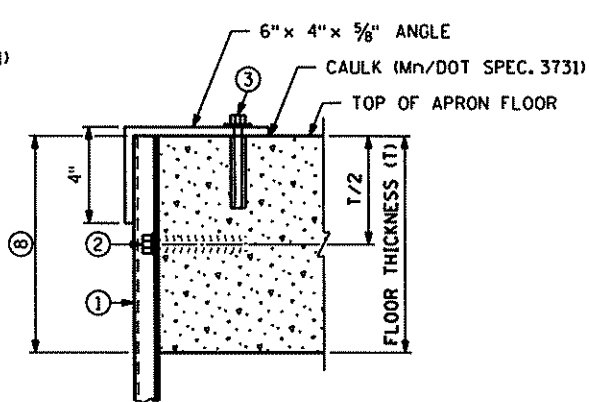
ELEVATION

DETAIL "B" - ALTERNATE 2
STEEL SHEET PILING SHOWN



ELEVATION

DETAIL "C" - ALTERNATE 3
ON NEW CONSTRUCTION ONLY



ELEVATION

DETAIL "D" - ALTERNATE 4
ON NEW OR OLD CONSTRUCTION

CONSTRUCTION NOTES

- GALVANIZE ALL FASTENERS AS PER Mn/DOT SPEC. 3392.
- BEFORE CULVERT PLANS ARE PREPARED, SAMPLES SHALL BE TAKEN FROM THE DRAINAGE AREA FOR PH DETERMINATION. THE SOIL AND WATER SHOULD HAVE A PH OF 6.5 OR MORE IF SHEET STEEL IS USED.
- ① 2 1/2" x 1/2" OR 2 5/8" x 1/2" CORRUGATED (12 GAGE) OR HEAVIER GALVANIZED STEEL SHEETS.
- ② FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER BY 4" LONG BOLTS AND APPROVED ANCHORAGES (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ③ FASTEN THE 8" x 4" x 3/4" OR 6" x 4" x 5/8" ANGLE WITH 3/8" DIAMETER 4" LONG BOLTS, 1" O.D. WASHER AND AN APPROVED ANCHORAGE (2'-0" SPACING).
- ④ FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER 5" LONG BOLTS, NUT AND LOCK WASHER (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ⑤ (12 GAGE) GALVANIZED CORRUGATED STEEL SHEET PILING, INTERLOCKING TYPE A.
- ⑥ 3/8" DIA. x 1" LONG BOLT WITH NUT, TO LAP STEEL SHEETS.
- ⑦ STEEL SHEET PILING, SECTION NO. MP-112 OR EQUAL.
- ⑧ FILL THE VOIDS AS SHOWN, WITH CONCRETE OR CONCRETE GROUT, AS APPROVED BY THE ENGINEER.

REVISION:
APPROVED: DECEMBER 11, 2000
Donald J. Blum
STATE BRIDGE ENGINEER

FIG. 5-395.111

12/16/2010 11:05:13 AM k:\0898-00\cad\plan\BR02J43\CBR02J43_DET4.dgn

NO	DATE	BY	CHK	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
DATE: 12/11/10 REG. NO.: 45501

WSB
& Associates, Inc.
INFRASTRUCTURE - ENGINEERS - PLANNERS

701 Xenia Ave, South Suite 300
Minneapolis, MN 55416
763-541-4800
FAX 763-541-4700

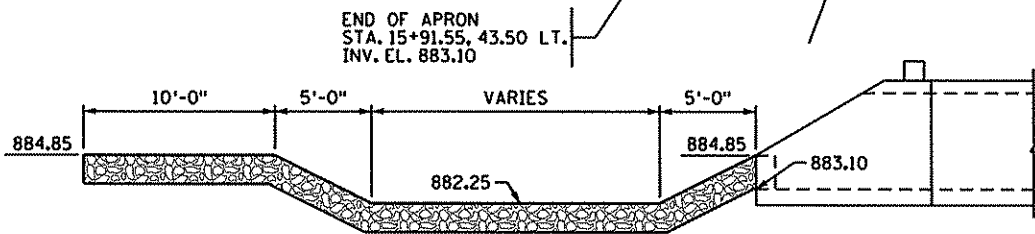
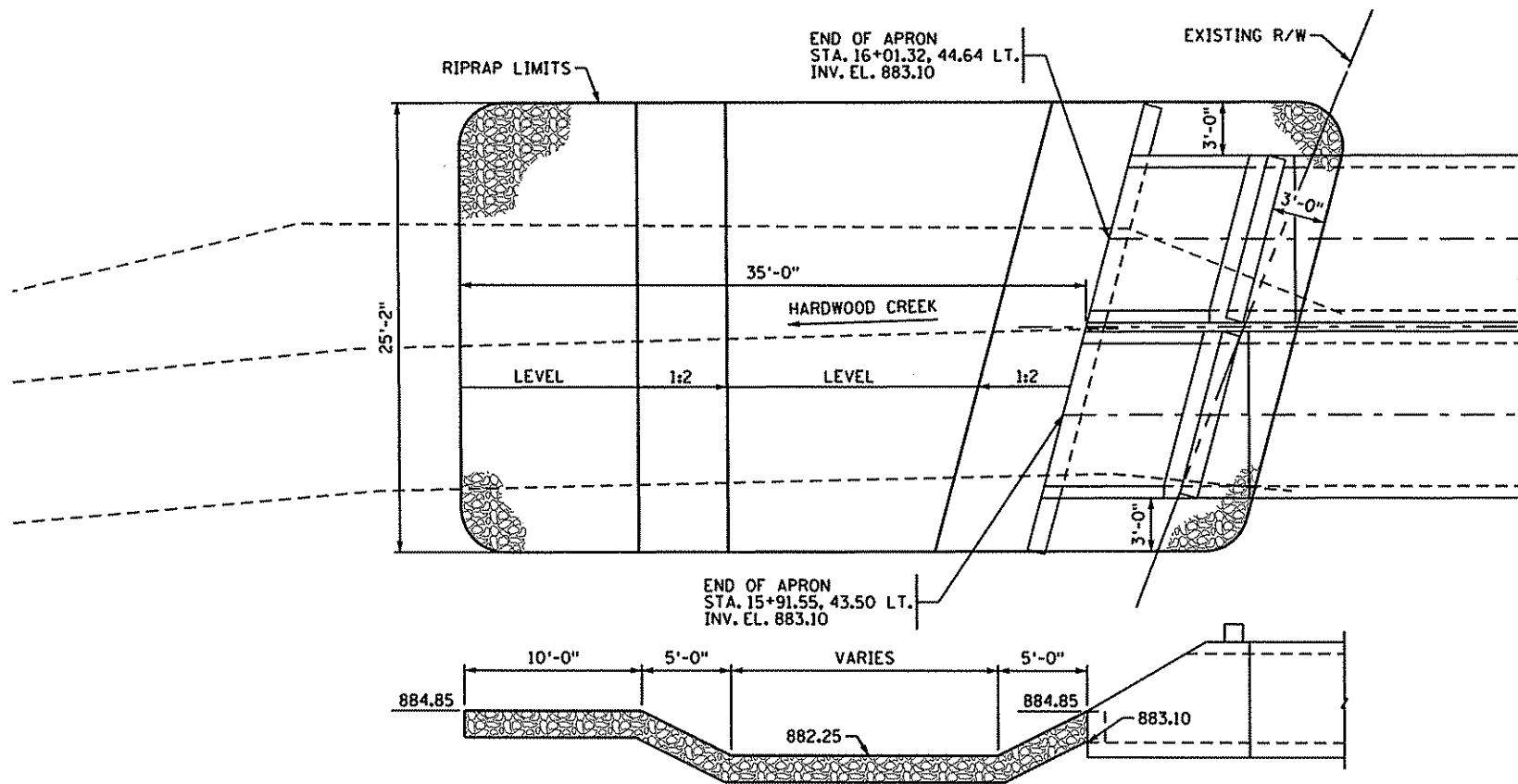
C.S.A.H. 54
ANOKA COUNTY
S.A.P. 02-654-02

TITLE:
ALTERNATE DROPWALLS FOR BOX CULVERTS

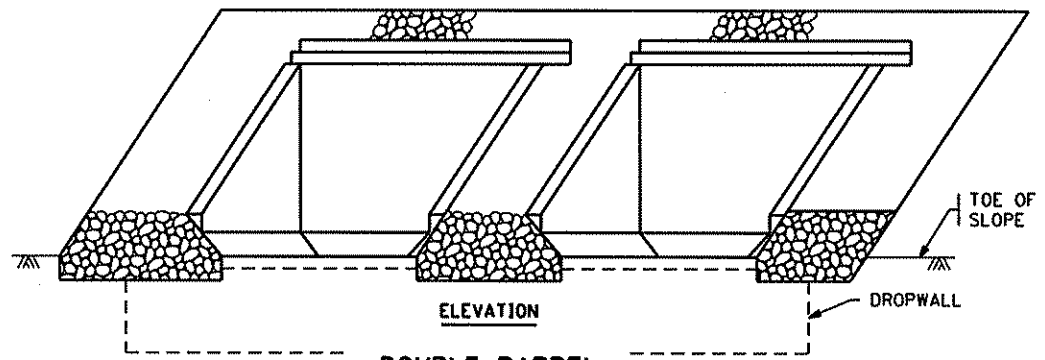
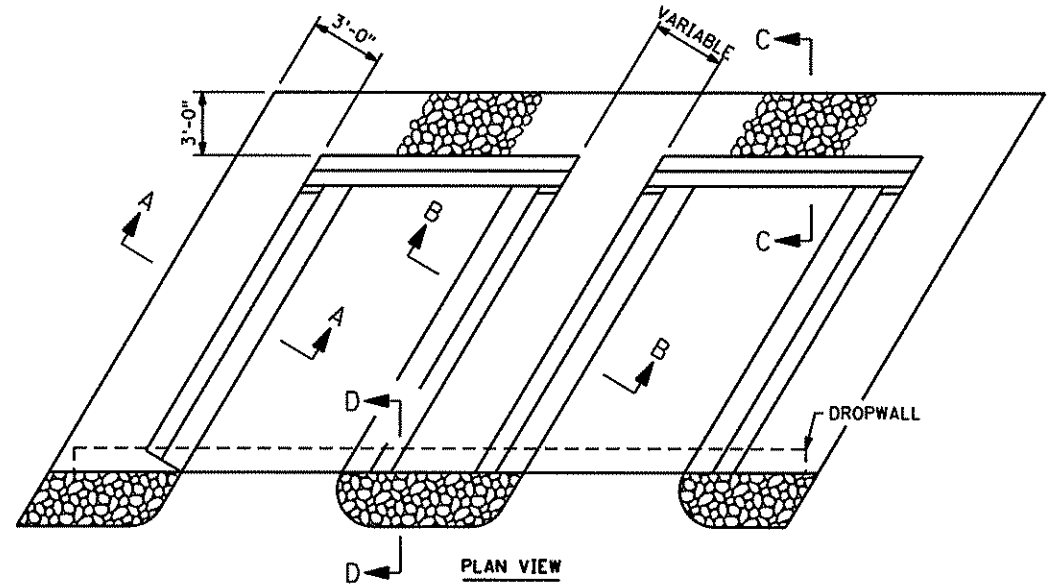
DES: JDA	DR: BJR
CHK: BRL	CHK: JDA

Sheet B5 of B8 Sheets

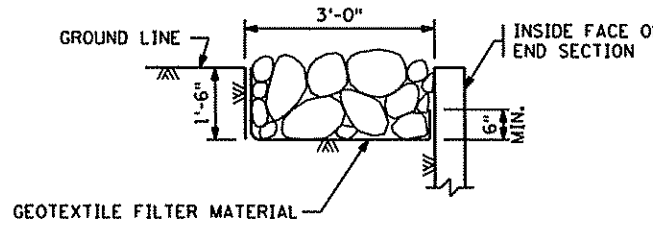
Bridge No.
02J43



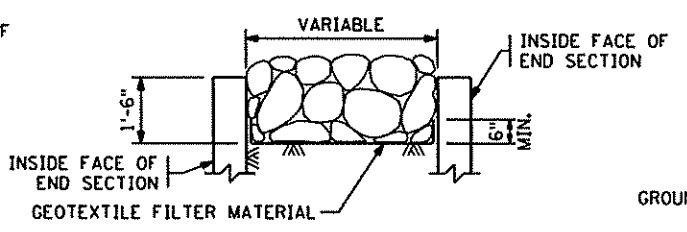
SCOUR BASIN OUTLET DETAIL



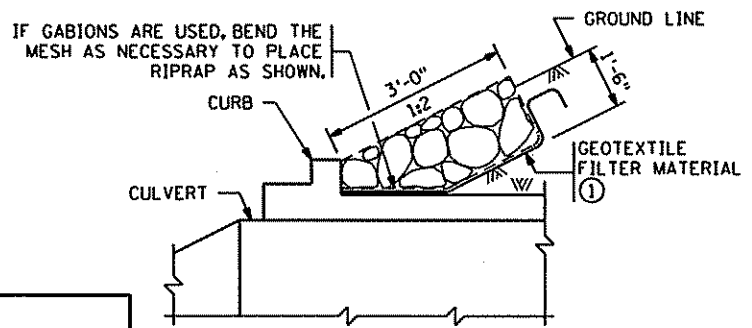
DOUBLE BARREL
CLASS III SHOWN
(FOR SKEWS OVER 7 1/2°)



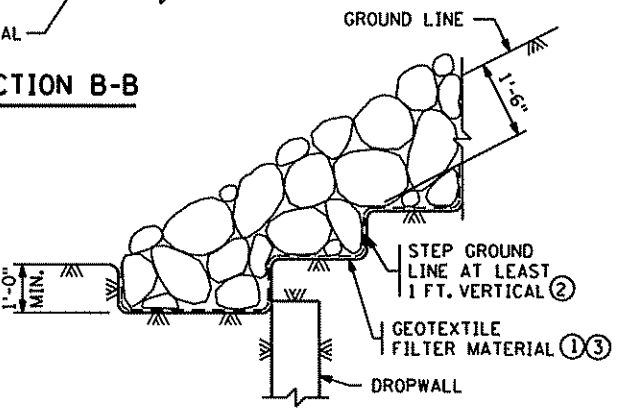
SECTION A-A



SECTION B-B



SECTION C-C



CLASS III RIPRAP OPTION

SECTION D-D

CONSTRUCTION NOTES

RIPRAP SHALL COMPLY WITH Mn/DOT SPECS. 2511 AND 3601. THE CONTRACTOR MAY USE EITHER CLASS III, WITH GEOTEXTILE FILTER MATERIAL, OR CLASS II ENCLOSED IN GABIONS, WITH GEOTEXTILE FILTER MATERIAL. 4" TO 8" DIA. ROCK MAY BE USED IN GABIONS, IF THE MESH OPENINGS ARE 4" OR LESS. GABIONS SHALL BE RIVER TYPE, CODE "D", 3 FT. WIDE X 1.5 FT. DEEP.

- ① FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE Mn/DOT SPEC. 3733. GEOTEXTILE STRIPS SHOULD BE CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. THE TOP EDGE SHOULD BE BURIED TO PREVENT UNDERMINING (Mn/DOT SPEC. 2511.3B).
- ② SLOPES 1:2 TO 1:3 MUST BE STEPPED TO MINIMIZE SLIDING POTENTIAL.
- ③ IF SLOPES ARE NOT STEPPED, GRANULAR FILTER SHOULD BE USED.

REVISION:
APPROVED: DECEMBER 11, 2000
Donald J. Blumley
STATE BRIDGE ENGINEER

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
James Archer
LICENSED PROFESSIONAL ENGINEER: JAMES ARCHER
DATE: *12/11/00* REG NO: 45501

WSB
& Associates, Inc.
701 Xenia Ave. South
Suite 300
Minneapolis, MN 55416
763-541-4800
FAX 763-541-1700
INFRASTRUCTURE - ENGINEERS - PLANNERS

C.S.A.H. 54
ANOKA COUNTY
S.A.P. 02-654-02

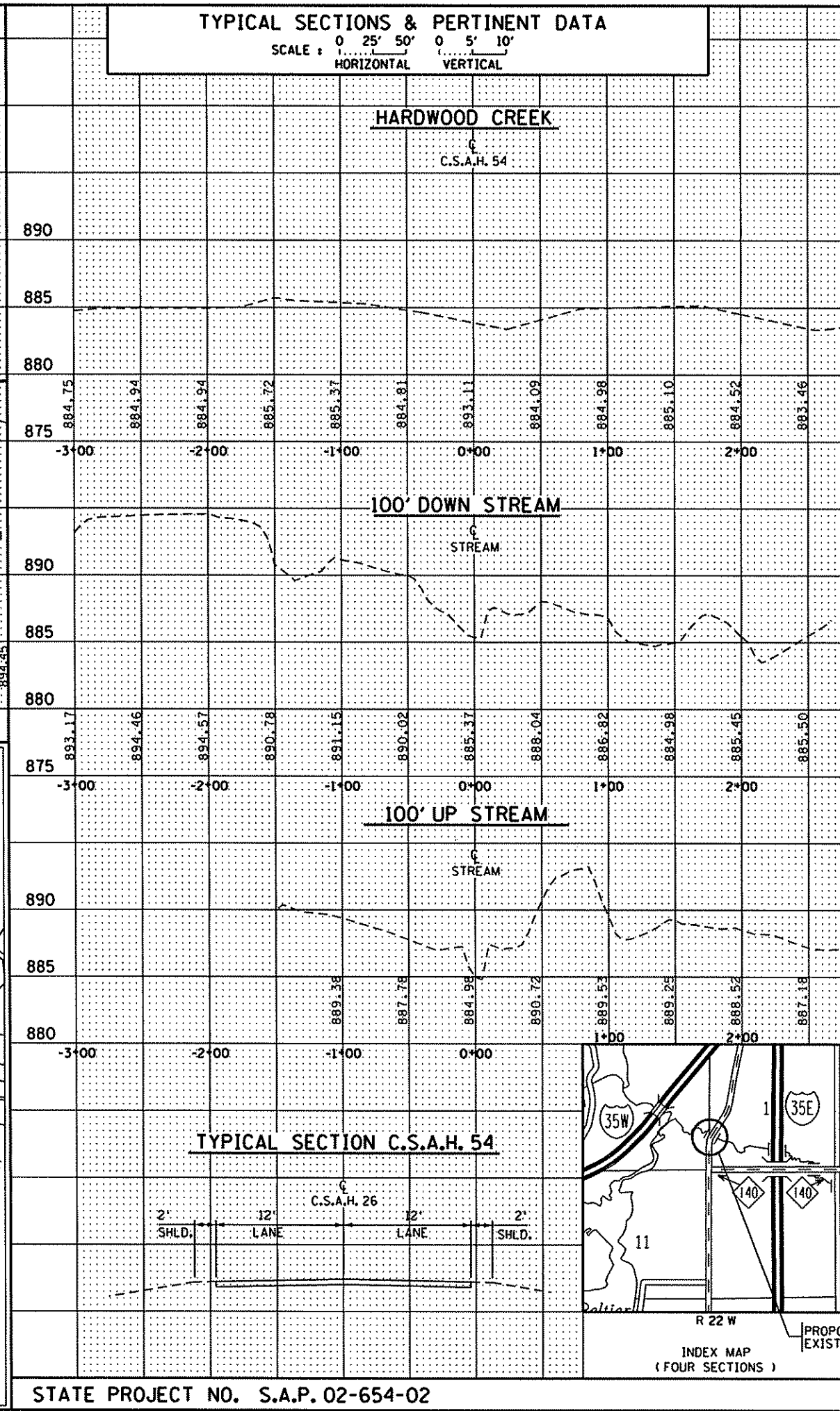
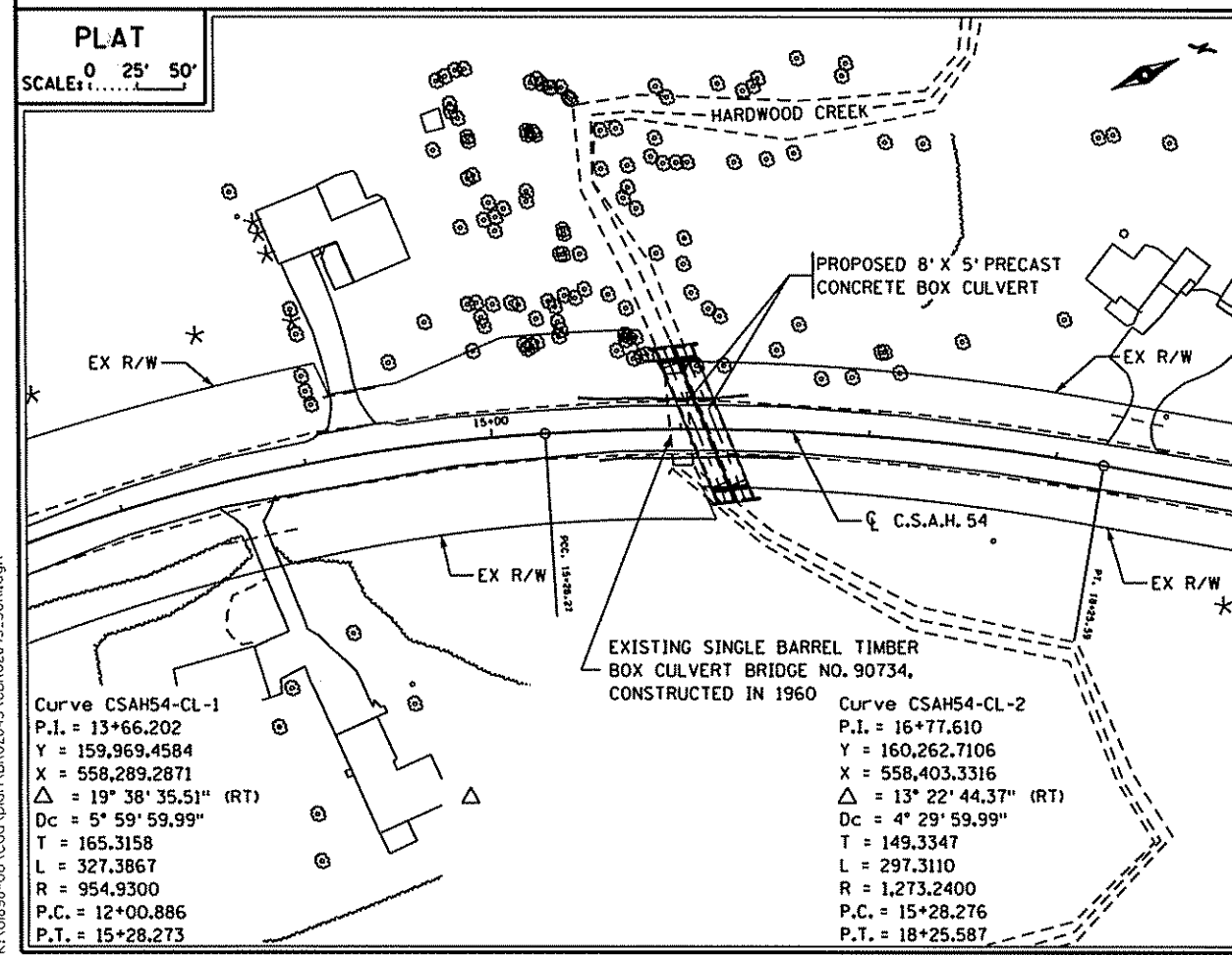
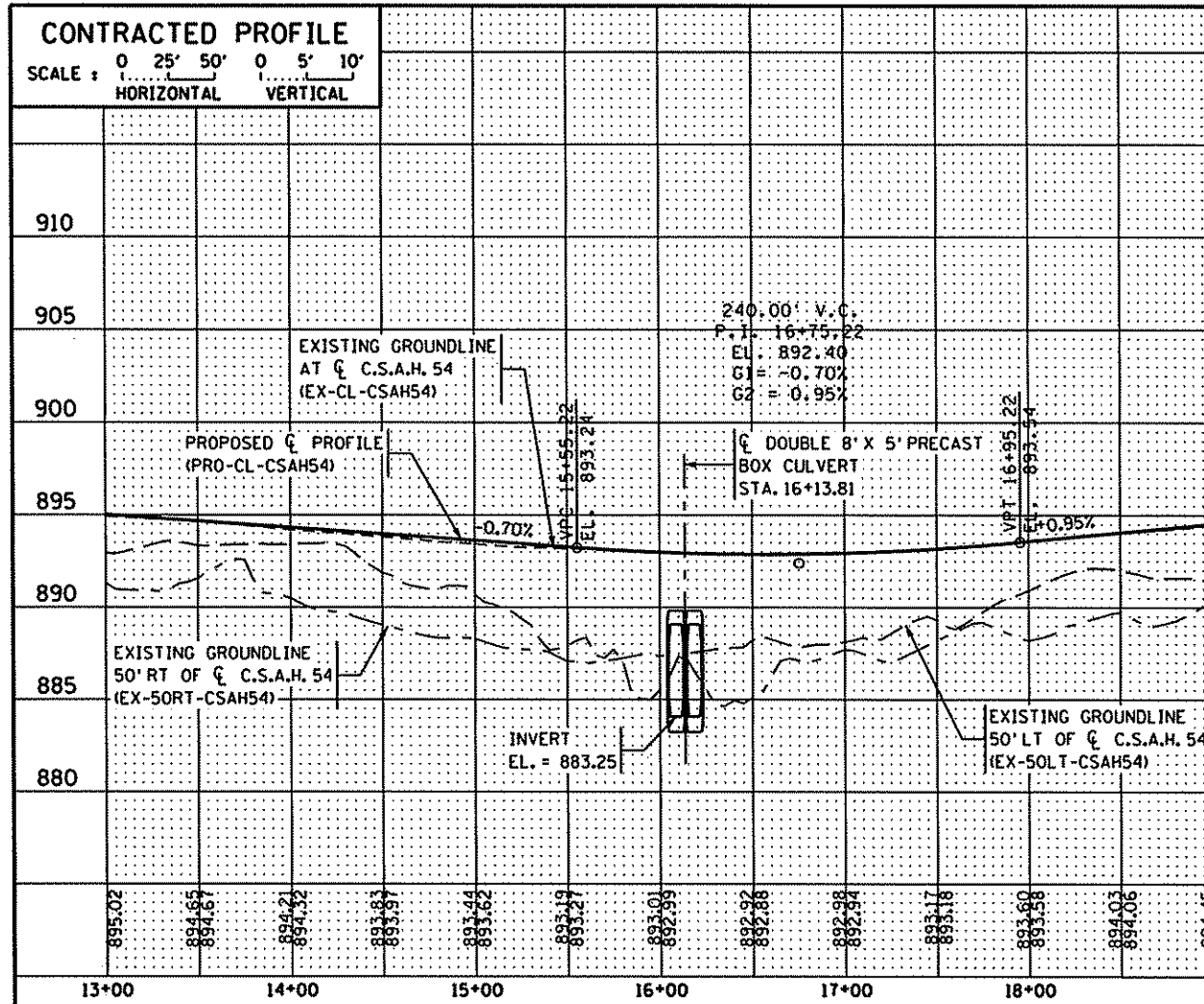
TITLE:
EMBANKMENT PROTECTION FOR BOX CULVERTS

DES: JDA DR: BJR
CHK: BRL CHK: JDA
Sheet B6 of B8 Sheets

FIG. 5-395.115

Bridge No.
02J43

12/16/2010 10:05:20 AM K:\0898-00\cad\plan\br02j43\CBR02J43_DET15.dgn



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: NONE
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM
UP STREAM: BR. NO. 97720 (ELM CREST AVENUE)
68-FT SINGLE SPAN
DOWN STREAM: PELTIER LAKE
- APPARENT HIGHWATER ELEVATION: UNKNOWN
OBTAINED FROM: N/A
- OTHER DATA: NONE

HYDRAULIC ENGINEERS RECOMMENDATION
DATE: 10/08/10

STREAM OR DITCH DESIGNATION: HARDWOOD CREEK
DRAINAGE AREA: 28.3 SQ. MI.
MAX. FLOOD ON RECORD: C.F.S. UNKNOWN
MAXIMUM OBSERVED HIGHWATER ELEVATION: UNKNOWN
DESIGN FLOOD (50 YR. FREQ.): 250 C.F.S.
HEADWATER ELEVATION: 889.2 FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE: 4.8 F.P.S.
TOTAL STAGE INCREASE: 0.9 FT.
LOW MEMBER AT OR ABOVE ELEVATION: N/A FT.
WATERWAY AREA REQUIRED BELOW ELEV. 888.3 FT. = 52 SQ. FT. AT RIGHT ANGLES TO CHANNEL
BASIC FLOOD (100 YR. FREQ.): 420 C.F.S.
HEADWATER ELEVATION: 891.8 FT.
TOTAL STAGE INCREASE: 2.4 FT.
MEAN VELOCITY THROUGH STRUCTURE: 8.1 F.P.S.
FLOWLINE ELEVATION: 883.2 FT. SKEW ANGLE: 22.5°
ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. N/A FT. (500 YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION
DATE: N/A
TOTAL SCOUR AT PIER EL. N/A (500 YR. FREQ.)
SCOUR CODE: E

BRIDGE SURVEY SHEETS MADE FROM :
ANKA COUNTY SURVEY ON 11/02/2009
BENCH MARK ELEVATION 893.10 (N.A.V.D. 88 ADJ.)
LOCATION: SURVEY CONTROL POINT "20000"
43 FEET SE OF BRIDGE NO. 90734
SOUTHEAST WINGWALL AND 38 FEET EAST OF THE PAVEMENT.

MNDOT MONUMENT:
HORIZONTAL DATUM NAD 83 (96 ADJ)
VERTICAL DATUM IS NAVD 88

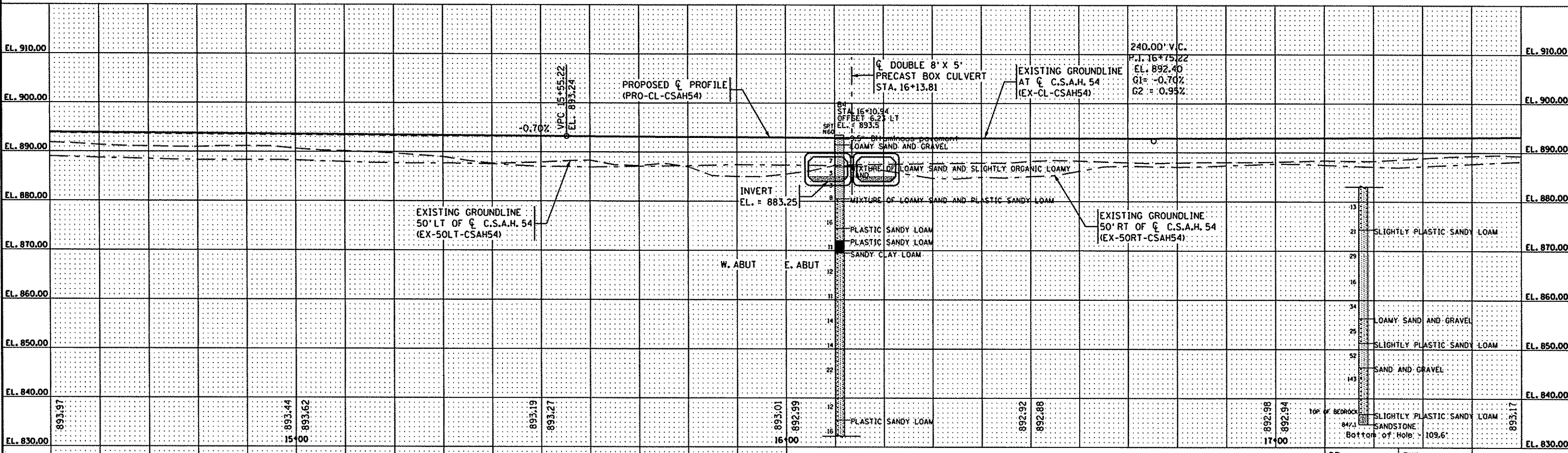
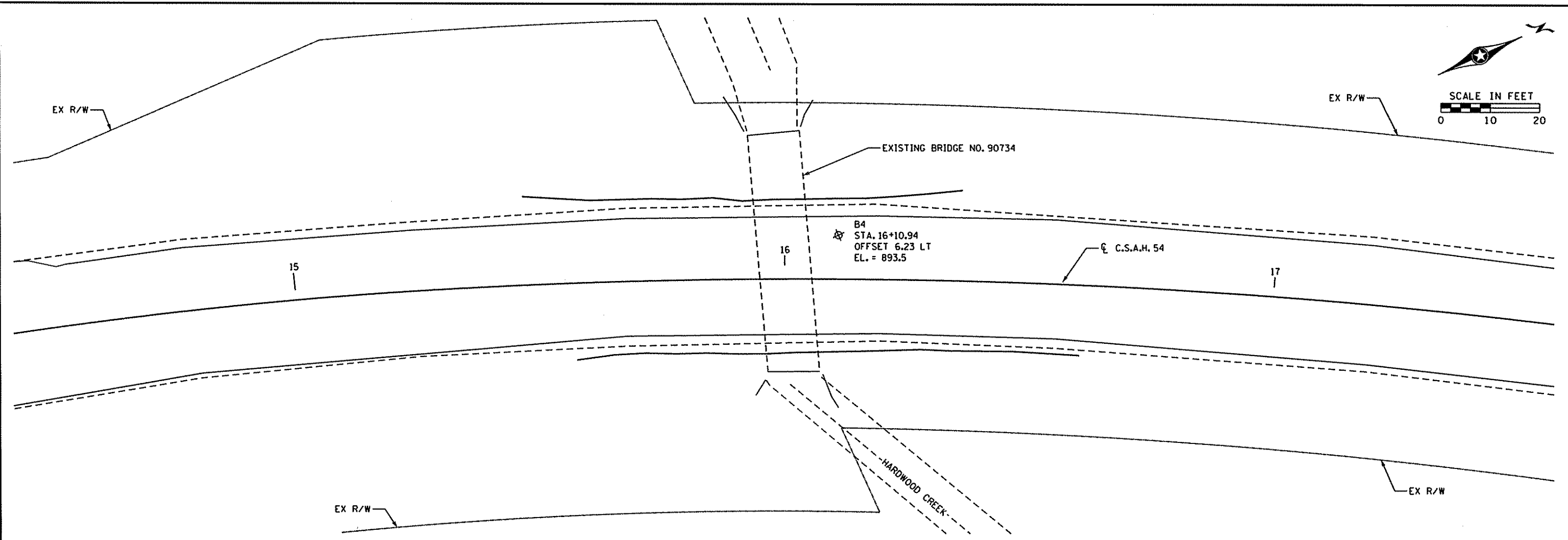
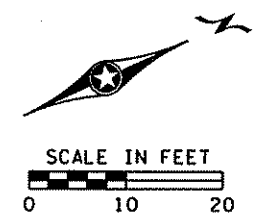
BRIDGE SURVEY

PROPOSED BRIDGE LOCATED ON C.S.A.H.54
1/4 MILE NORTH OF JCT. C.S.A.H. 54
AND C.R 140 OVER HARDWOOD CREEK.

SEC 2 T 31 N R 22 W
COUNTY: ANOKA
TOWNSHIP: CENTERVILLE

BRIDGE NO. 02J43

12/16/2010 10:05:27 AM K:\0898-00\cadd\plan\B702\J43_CBR02\J43_SURI.dgn



BRIDGE SURVEY - PLAN AND PROFILE

STATE PROJECT NO. S.A.P. 02-654-02

SHEET NO. B8 OF B8 SHEETS

BRIDGE NO. 02J43

DR: BJR CHK: JDA

12/16/2010 11:05:33 AM
K:\01898-00\cod\plan\BR02J43\BR02J43_SUR2.dgn